Space Weather Forecast

Issued on Saturday, 02 March 2024 at 12:48 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Risk of Moderate or Strong flares from the large sunspot in the northwest declining slowly. Slight chance of G1 Minor geomagnetic storm conditions Days 1-2 (02-03 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low during the past 24 hours, with low level flare activity. There are seven sunspot regions on the disc. The region in the far northwest remains the largest and most significant potential flare source as it rotates towards the limb. The other region in the northwest saw some simplification of magnetic structure, with interior spots fading. The region in the southwest conversely has continued to develop, with growth observed within the central portion and a moderately complex magnetic structure. A new region on the southeast limb was numbered, and may still reveal trailing spots as it rotates further onto the disc and the classification likely to change as it comes further into view. Remaining regions remain smaller and or simpler including another newly numbered region in the far southeast.

No Earth directed Coronal Mass Ejections (CMEs) were identified in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were at slow-ambient levels, varying between 300-390km/s, generally on a weakening trend. The interplanetary magnetic field was weak throughout. The north-south component varied weakly, but was mostly southward directed. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with isolated Moderate flares remaining likely in the near term. There remains a slight chance of Strong flares from the large region in the far northwest, although through Days 2 and 3 (03-04 Mar) this risk diminishes as this area rotates over the west limb.

Solar Wind / Geomagnetic Activity: There are three recent CMEs which are all most likely to largely miss Earth, but with a risk of some glancing influence later on Day 1 (02 Mar) or early Day 2 (03 Mar). Otherwise no notable solar wind enhancements are expected.

Geomagnetic activity is therefore forecast to be mostly Quiet, perhaps increasing to give Unsettled to Active intervals with any CME influence on Days 1 and 2, with a slight chance of isolated G1/Minor Geomagnetic storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of rising above the S1/Minor Radiation Storm threshold in response to any notable flares from the large sunspot in the northwest of the disc, even as this rotates beyond the western limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	40	30
Very Active	R3 to R5 X	No	15	15	5	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	10
Very Active	≥ S3 *	No	5	5	5	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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